

## Claims

- [c1] A high volume, wall-mountable air sanitation apparatus for disinfecting and removing VOCs from air with high energy UV light and ozone, comprising:  
a casing with an interior, a first side and a second side;  
a means for moving air located at the first side of the casing, the air moving across at least one elongated target comprising a target compound, said target compound comprising at least one selected from the group consisting of titanium dioxide, copper and silver; and  
an elongated high energy UV light source adapted to direct UV light toward the air and the target whereby the UV striking the air and the target in the presence of water will generate at least one selected from the group of hydro-peroxides, super-oxide ions and hydroxyl radicals.
- [c2] The apparatus of claim 1, wherein the target compound further comprises approximately 0-30% titanium dioxide, 0-30% silver, and 0-30% copper, by weight.
- [c3] The apparatus of claim 1, wherein the target compound further comprises a hydration compound of silica gel.
- [c4] The apparatus of claim 1, wherein the target comprises a mesh at least partially located between the UV light source and the air.
- [c5] The apparatus of claim 1, wherein the UV light source emits UV light at a wavelength of approximately 185 nm to 254 nm.
- [c6] The apparatus of claim 4, wherein the target further comprises a secondary element located a predetermined distance from the wire mesh, whereby at least a portion of the UV light coming through the mesh strikes the secondary element.
- [c7] The apparatus of claim 6, wherein the secondary element comprises a target compound comprising approximately 0-30% titanium dioxide, 0-30% silver, and 0-30% copper, by weight.
- [c8] The apparatus of claim 1, wherein the means for moving air comprises a fan

located in the interior of the casing.

[c9] The apparatus of claim 1, further comprising a particulate filter for removing particulates from the air before the air is moved over the target compound.

[c10] The apparatus of claim 8, whereby reflected UV light is visible from the exterior of the casing through the blades of the fan, whereby a person may observe that the UV lights within the apparatus are operating.

[c11] The apparatus of claim 1, wherein the UV light source comprises one or more low-pressure mercury UV lights.

[c12] The apparatus of claim 11, wherein at least one separate mesh target surrounds each low-pressure mercury UV light.

[c13] The apparatus of claim 11, wherein a mesh target may be affected by more than one UV light source.

[c14] An apparatus for efficiently disinfecting and removing VOCs from air with high energy UV light, comprising:  
a high energy UV light source capable of generating ozone from oxygen in air;  
a mesh target located at least partway between the high energy UV light source and the air, the target including a target compound comprising at least one selected from the group consisting of titanium dioxide, copper and silver, whereby the UV light and the target compound generate in the presence of water at least one selected from the group of hydro-peroxides, super-oxide ions and hydroxyl radicals; and  
a secondary target element located a predetermined distance from the mesh target, the secondary target element including the target compound, whereby at least a portion of the UV light that passes through the mesh target strikes the secondary target element, thereby generating additional hydro-peroxides, super-oxide ions and hydroxyl radicals to that generated by the mesh target.

[c15] The apparatus of claim 14, wherein air generally flows in the volume between the mesh target and the secondary target.

[c16] The apparatus of claim 14, wherein the secondary target acts as a conduit for

the moving air.

- [c17] The apparatus of claim 15, wherein the target compound further comprises a hydration compound of silica gel.
- [c18] The apparatus of claim 14, wherein the UV light source is one or more low-pressure mercury UV lights.
- [c19] A wall mountable method for treating a large volume of air, comprising:  
directing the large volume of air toward a target comprising a target, said target comprising a compound consisting of titanium dioxide, silver and copper; and  
directing UV light toward the target, said the UV light being at a wavelength sufficient to generate ozone from oxygen in the air and being sufficient to generate at least one selected from the group consisting of hydro-peroxides, super-oxide ions and hydroxyl radicals from interaction with the compound in the presence of water.
- [c20] The method of claim 19, wherein the target comprises a mesh located generally between the air and the UV light.
- [c21] The method of claim 20, wherein the target further comprises a secondary element located a predetermined distance from the mesh whereby the air generally passes between the mesh and the secondary element and UV light passing through the mesh strikes the secondary target element in the presence of water, thereby generating additional hydro-peroxides, super-oxide ions and hydroxyl radicals to that generated by the mesh target.